

## 04 – Soft Landscaping

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Version	Date	Authors	Summary of Changes
1.1	5 August 2010	George Abraham	Annex B added: Unacceptable Practice
1.2	9 September 2010	George Abraham	13.3 text added: AS 4970: Protection of trees on development sites.
1.3	9 September 2010	Mel Walker	<i>TreeNet</i> database updated to <i>ANU Tree database</i> and associated changes.
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## Introduction

**04.01** This section of the Campus and Building Requirements Manual (the CBRM, the Requirements or the Manual) covers soft landscaping and vegetation.

**04.02** The CBRM documents the minimum design and construction requirements for new, refurbishment or repurposed building works, landscapes and engineering/infrastructure projects on buildings, facilities and campuses of the Australian National University (the ANU or the University). The Requirements are prepared for the direction of a Consultant, Designer or Project Manager in the preparation of project specific documentation and in the delivery of project works.

**04.03** Notwithstanding any Consultant's particular discipline or area of responsibility, each Consultant and/or designer shall consider the document in its entirety. The complete CBRM consists of the following Sections which may be referred to within this Section:

Campus and Building Requirements Manual	
<b>Section 01</b>	General Requirements
<b>Section 02</b>	Architectural Requirements
<b>Section 03</b>	Roads, Car Parking & Civil Works
<b>Section 04</b>	Soft Landscaping
<b>Section 05</b>	Roofing, Roof Fabric & Roof Safety
<b>Section 06</b>	Building Management Systems
<b>Section 07</b>	Electrical Services
<b>Section 08</b>	Fire Protection Systems
<b>Section 09</b>	Hydraulic Systems
<b>Section 10</b>	Mechanical Services
<b>Section 11</b>	Lifts, Cranes & Vertical Transportation Systems
<b>Section 12</b>	Security, CCTV & Access Control

## Liaison

**04.04** The Consultant commissioned to consider and prepare soft landscape designs specific to a built or natural environment project is required to consider, design and document:

- Broad landscape guidelines and site specific issues;
- Preliminary plans and concepts;
- Development of landscape details; and
- Final landscape plan proposals.

**04.05** The Consultant commissioned is advised at various project stages the ANU Project Coordinator is required to consult with the ANU Gardens and Grounds staff. The consultations are required to review the project proposals and to provide the Gardens and Grounds staff opportunity to provide feedback to the proposed design and its elements

**04.06** The Project Coordinator will brief Gardens and Grounds on the landscape component of new projects at an early stage in the design development process. Gardens and Grounds will generate a soft and hard landscape user brief specific to each project for consideration by the Consultant.

**04.07** The University landscape features a diverse range of landscape themes there are no definitive plant selection guidelines. Consultants and designers will be advised on appropriate plant selection for all projects undertaken on the campus.

#### **Landscape Distinction**

**04.08** The most significant characteristic of the Acton campus of the ANU is the landscape – a mix of native and exotic plantings, with the Sullivans Creek waterway reinforcing this natural environment. Over the last ten years there has been a significant amount of new buildings and other work on the campus that has sometimes impacted negatively on the quality of the landscape. Procedures have been developed with the aim of protecting the landscape and ensuring that damage to it is minimised. The purpose of this document is to clearly articulate the aims, methods and procedures to protect the landscape during any works that have the potential to cause damage.

**04.09** The Requirements are applicable to the whole landscape of the campus including lawns, planting beds and native grassland. However, because of their visual significance, their age, and the time it may take for damage to them to become apparent, it is damage to trees that is of most concern, and towards which these Requirements are largely directed. The major causes of damage to trees are vehicles and machinery (directly by damage to trunks and branches, or indirectly by soil compaction in the root zone) and new service reticulation (particularly through trenching within root zones). The Requirements seek to minimise such damage by:

- Surveying and classifying all trees on campus, to provide a database for informed advice and action.
- Making reference to this database a precondition for all work on the campus that has the potential to damage trees.
- Requiring the responsible Consultant to seek the appropriate approvals before carrying out any such work on the campus.

**04.010** Emphasis is placed on prevention of landscape damage, through following correct procedures, rather than on penalties after the damage has occurred.

## Habitat

**04.011** The ANU has developed a [Biodiversity Management Plan](#) which should be consulted where any work has a potential habitat impact. Habitat is to be conserved or improved over the course of a project and any impact on the landscape properly rehabilitated.

**04.012** Habitat improvement can be achieved by many initiatives:

- selecting appropriate plant species and creating habitat structures (rocks, logs and the like) in the landscape;
- creating an appropriate niche ecology as part of the landscaping of the site; and
- improving the site hydrology through integrating an in-built stormwater/greywater collecting system, with the intent of reusing the water in on-site landscaping, to improve resilience of the local landscape.

## Landscape Planting Plan and Soil Specifications

**04.013** The Requirements of the ANU for the planting plan and soil specifications shall be determined in consultation with the Principal's Representative (the Principal or the Principal's Project Manager).

## Grass Types

**04.014** The use of *Poa labillarderi* is prohibited for use on the campus.

## Landscaping Water Use

**04.015** No permanent non-potable irrigation systems are to be installed in landscaping.

**04.016** Landscaping must be designed to retain water such that healthy, robust soil ecology is maintained:

- water infiltration to ground water is to be maximized;
- water movement is slowed and takes the longest practical path toward waterways, providing the greatest ecological benefit; and
- avoid excessive water-logging that will result in prolonged anaerobic soil conditions.

## Soil

**04.017** Maintaining and improving soil quality is the highest priority underpinning all grounds maintenance activities on the campus. Compacted or disturbed areas of soft landscape within, adjacent to or associated with a construction project must be refurbished as part of the project scope of work. The process of soil refurbishment is based on the relief of soil compaction and the incorporation of additives such as gypsum and organic matter.

**04.018** The specifications for soil works as part of a project's landscape component are to include 'hold points' in the construction process for appropriate inspections to areas of installation and restoration works.

### Topsoil

**04.019** All topsoil removed during the construction process is utilised such that it remains productive. This requires:

- all topsoil impacted by the construction works is separated and protected from degradation, erosion or mixing with fill or waste; and
- 95% of all topsoil (by volume) retains its productivity. For example, it is returned to the top 100 mm of a natural soil substrate as quickly as is feasible.

Topsoil is to remain and is to be reused on ANU grounds.

### Edge Treatments

**04.020** In general, edge treatments such as timber strips or concrete mowing strips are not required as a division between grass areas and garden beds. The requirement for mowing strips along building edges will be assessed as required.

### Indoor Plants

**04.021** Indoor plants are not be specified or installed as part of a project.

**04.022** It is the responsibility of building users and occupiers who install indoor plants post project to maintain (including cleaning) indoor plants and associated elements.

### Trees

**04.023** Designers for projects with a landscape component will consider the strategic selection and placement of trees as shading devices, to assist in reducing the energy costs for buildings and improve the internal environment. Examples of this could include:

- the provision of deciduous trees (at an appropriate distance from a façade);
- the consideration of foliage to cool air; and/or
- the selection and placement of plants to improve the air quality.

### Tree Protection or Removal

**04.024** The selection and specification of established trees of appropriate species and sound structure are beneficial components of the built environment and a potential asset to any development site.

**04.025** Trees on development sites shall be protected in accordance with *AS 4970 Protection of trees on development sites*.

**04.026** Development proposals should endeavour to retain existing trees wherever possible and practical to do so. Any trees that require removal shall be identified to the Principal's Representative and prior approval obtained before designs proceed.

**04.027** The ANU has a comprehensive survey of trees within the Acton campus for reference purposes. The requirements of this section of the CBRM apply to all other Campuses.

**04.028** The Consultant is required to ensure that all trees within a construction site that are to remain are identified and appropriate tree protection measures are undertaken to prevent damage or destruction during construction. The proposed methods for tree protection should be discussed and documented prior to work commencing on site.

### Tree Survey Database

**04.029** A digital survey of all trees on the Acton campus currently exists, each tree has been rated according to the following categories. Information pertaining to the location, species, and category of trees on the ANU Acton campus is stored on the Tree Survey database.

<b>Exceptional Trees</b>	These are the most significant and valuable trees on the campus because of their age, rarity and prominence within the landscape. Except in exceptional circumstances, <b>no</b> activity involving disturbance of the Tree Protection Zone (TPZ) of these trees will be allowed, other than that carried out by Gardens and Grounds staff, or contractors under their immediate supervision. In exceptional circumstances, application may be made for a specific Works Approval for such activity, from the National Capital Authority.
<b>High Quality Trees</b>	These comprise the bulk of mature, healthy trees on the campus. Any work within the TPZ of high quality trees will require the specific approval of the Principal's Representative.
<b>Medium Quality Trees</b>	This class covers trees that tend to be immature. Whilst every effort should still be made to minimise damage to such trees, (as they are the ANU high quality trees of the future), their value to the landscape is less than that of the previous two classes of trees. The level of protection to be accorded to such trees will be at the discretion of the Principal's Representative.
<b>Low Quality Trees</b>	Trees that have been placed in this category are usually small trees, mostly new plantings. The level of protection to be accorded to such trees will be at the discretion of the Principal's Representative.

**04.030** In all cases where work may impact on the TPZ of a tree (irrespective of its particular classification), the Principal's Representative is to be consulted before any work commences.

**04.031** The criteria by which trees are categorised are detailed in the ANU Tree Management Plan:

<https://services.anu.edu.au/campus-environment/sustainability-environment/gardens-grounds>

### Irrigation

**04.032** The ANU requires the landscape forming part of each project be suitably irrigated according to the plant species, soil type and topography.

**04.033** In general micro or low volume irrigations systems are not to be installed as part of any new landscape areas.

**04.034** The installation of irrigated lawns is to be restricted to areas where a high quality lawn surface is required to provide amenity for staff or students. Irrigated lawns are to have automated underground irrigations systems installed. The use of Hunter irrigation products is preferred to maintain continuity throughout the campus.

**04.035** Where an irrigation system is required, the installation shall form part of the project and is to be fully documented. Irrigation systems will be designed and installed by a suitably qualified and experienced irrigation specialist taking consideration of water efficient design principles, such as using low flow sprinkler heads and/or drip irrigation. Consideration should be given to using rain sensors and soil moisture probes to limit unnecessary irrigation events.

**04.036** As a general requirement Buckner (or equal equivalent) brass quick coupler valves shall be installed at 20.0 m spacing throughout garden beds to be used for plant establishment only.

**04.037** All proposed irrigation designs should be presented to the Principal's Representative for comment.

**04.038** All irrigation systems must be supplied with non-potable water and sign posted accordingly. In instances where recycled waste water is used all valve boxes and sprinkler heads shall have lilac coloured lids/tops.

**04.039** Irrigation systems shall be separately metered and shall not form part of the cold water supply for a particular project. Refer to [Section.06 Building Management Systems](#).

**04.040** The ANU prefers electronic control devices control irrigation systems. Consultants are to discuss the matter with the Principal's Representative. In general Hunter components (or equal equivalent) are to be used including gear drive pop up sprinkler heads, solenoid valves and electronic control boxes shall be used so as to standardise components across campus.

**04.041** All electric solenoid valves are to incorporate an isolation valve, Philmac (or equal equivalent) of ball valve of equal size. Lilac coloured handle for recycled water, blue handle for potable water.

**04.042** Irrigation controllers to be housed in lockable metal enclosures.

**04.043** Automatic irrigation systems, drip or sprinkler, are to incorporate Hunter rain-clip sensors (or equal equivalent).

**04.044** Larger projects to incorporate Hunter flow-clip sensors (or equal equivalent) downstream of the master valve in the event of a rupture or leak occurring as this will automatically shut-off the water flow and save water.



## Process

### Procedures for Obtaining Clearances

**04.045** The earlier that the issue of landscape protection is considered and addressed in any project; whether the project be a new building, building extension or an underground service; the more easily will the requirements for such landscape protection be integrated into the program and budget of that project. Therefore the emphasis should always be on addressing this issue earlier rather than later.

- **New building project in feasibility and planning phase:** Consultants are to consider the impact on the existing environment. A preliminary tree report produced by the ANU is required to guide the development design layout so that the proposed building footprint has a minimal impact on the trees and landscape. It is crucial that service easements are also considered at this stage. Once the design has been reviewed and finalised, the ANU will produce a final tree report for the Campus Planning Committee and the National Capital Authority, detailing the overall impact of the project on the trees and landscape.
- **Buildings and Projects already under construction:** Where it has become apparent that work will be required within the drip line of a significant tree (and this work was not identified in the course of previous approvals) specific application will need to be made to the Principal's Representative.
- **New sub-surface services reticulation:** The Principal's Representative will obtain confirmation from the Consultants of the impact, if any, on significant trees at the planning stage.

### Landscape Protection Plan

**04.046** Where required by the project, Consultants will prepare a Landscape Protection Plan (LPP). The scope of the LPP will vary according to the nature of the project. Generally the LPP will take the form of a site plan marked up with notes relating to the various landscape protection issues. Amongst the issues that may need to be addressed in the LPP are:

- **Site features:** Site features requiring particular protection include underground irrigation, lawn areas and/or significant trees and sensitive landscape sites. Such features may need to be protected by fencing, and the Consultants will be responsible for ensuring project specific documentation indicates protection to these areas including areas are not entered or used for any purpose associated with the project.
- **Site access:** This is to be agreed on the basis of minimizing landscape damage while providing convenient access. Where boom gates are installed, they will be used to regulate each entry/exit to the site. Where heavy or special vehicle access is required suitable damage minimization measures are to be undertaken such as timber boards positioned in wheel traverse areas over 'soft' landscape.
- **Contractor vehicle parking:** Consultants are required to provide project specific documentation indicating the extent of the site, the site enclosure and the site parking. If this area encompasses existing soft landscape features, strategies to minimise damage/compaction will be required.

### Individual Tree Protection

**04.047** The following procedures for protecting individual trees will form part of the LPP for any project impacting on a significant tree or significant trees. In addition, even where a LPP is not required, these procedures are to be implemented and followed whenever activity is taking place within the drip line of any tree deemed worthy of retention.

**04.048** In order to protect significant trees, the following procedures are to be followed:

- a preliminary tree assessment should be carried out at the beginning of the project of all trees on-site. All trees and landscapes potentially affected by the project should be reported on by the Consultant as the basis for deciding which trees are suitable for retention;
- an arboricultural impact assessment will be prepared once the final layout is complete. It will include the following main elements:
  - o identification of trees to be removed, retained or transplanted;
  - o identification of possible impacts on trees to be retained;
  - o determination of TPZs for trees to be retained. Refer to AS 4970 for determining the TPZ (ANU requires the minimum TPZ is calculated at DBH x 12);
  - o a tree protection plan (drawing) showing the TPZs for trees being retained. The tree protection plan should be included in subsequent construction documentation; and
  - o measures necessary to protect the trees throughout all construction stages.

**04.049** A list of tree protection measures are listed in AS 4970. These measures are identified in the arboricultural impact assessment and tree protection plan. A process for monitoring should be identified in all stages of development works.

- **Identifying a TPZ:** Where there is the likelihood of a project impacting on existing trees, the Consultant must ascertain if any significant trees are likely to be affected. The size and shape of a particular protection zone will vary according to individual tree species and the site. The zone will be determined by an Arborist prior to commencing the project and will remain in place until project completion.
- **Pruning:** Prior to establishing a TPZ, trees to be protected will be pruned by ANU Gardens and Grounds. No project activity to undertake any additional pruning will be allowed.
- **Establishing the TPZ:** In addition to AS 4970 the following measures are required (long term projects only):
  - o Mulching – 100 mm of composted mulch cover over the ground within the TPZ in order to retain soil moisture and encourage microbial activity.
  - o Drainage – the natural drainage patterns around the root zone should not be altered.
  - o Signage: to be supplied and erected by the Gardens and Grounds Section

### **Landscape Construction**

**04.050** The ANU may decide to use their internal grounds maintenance resources for certain parts of the construction of new landscape works or alterations to existing. Such scope of works will be identified to the Consultant at time of commissioning.

### **Landscape Protection during Construction**

**04.051** The ANU requires the Consultant to take responsibility for the preparation of documents which indicate the processes and methods for the protection of existing landscapes from construction-related activities and construction personnel vehicle parking. Parking arrangements that are agreed with the Principal's Representative shall be clearly documented for construction purposes.

### **Definitions**

For the purposes of this document, the following definitions are used:

#### **Arborist**

A specialist in the care and cultivation of trees. The ANU has a dedicated Arborist.

#### **DBH**

Diameter of tree trunk at breast height; nominally 1.4 m above ground level.

#### **Drip Line**

The area of ground directly below the outer edges of the canopy.

#### **Root Zone**

The space within the soil occupied by the root system of a tree. Unless otherwise defined by the Principal's Representative, the root zone will be assumed to be equivalent, in plan, with the TPZ.

#### **Significant Tree**

A tree that has been categorised as Exceptional, High or Medium quality (see definitions in the following Section).

#### **Tree Canopy**

The space that is occupied by the branches and leaves.

#### **Tree Protection Zone**

A defined area of ground where no activity is to be undertaken. Unless defined otherwise by the Principal's Representative. This zone will comprise a circular area, with its centre as the trunk of the tree. Refer AS 4970.